



4. How do you average speed?

5. How do you calculate acceleration?

6. What are the units of measurement for speed/velocity and acceleration calculations?

**Hypothesis: create an “If...then...” statement for this lab.**

**Materials:**

1. Stopwatch
2. Chalk or masking tape
3. Tape measure
4. Graph paper
5. Object to move (some options):
  - a. Yourself - walking, running, swimming, etc.
  - b. Toy car

c. Ball

6. Ramp: to push the toy car or ball down OR smooth surface

**Procedure:**

**Step 1:**

1. Using your chalk or measuring tape mark off your starting and stopping distance. How long your overall distance is will depend on the type of motion you choose.
2. Practice the motion of your choice and try to keep it at a constant rate
3. Time the motion: start the stopwatch as soon as the motion starts and stop it as soon as the motion hits the final mark of distance
4. Take notes on the steps you took to keep the motion constant and record data in data table 1, below
5. Graph data points, speed versus time

**Step 2:**

6. For this part of the lab you will be testing acceleration; recommend that you complete at least 2 practice trials
7. Using your chalk or measuring tape mark off 4 equal distances apart. For example: 0m, 6m, 12m, 18m, 24m or 0cm, 6cm, 12cm, 18cm, 24cm depending on the motion
8. Start at your zero mark and begin the motion; the goal is to see if acceleration occurs
9. Time the motion: start the stopwatch as soon as the motion starts and stop it as soon as the motion hits the final mark of distance
10. Each time the object in motion hits the 4 equal distances record the time in data table 2
11. Calculate average speed and acceleration and record in data table 2
12. To challenge yourself, repeat the above steps for step 2 and instead of accelerating, decelerate

**Data Table 1:**

**Average speed:**

Distance (unit)	Time (sec)	Speed (unit/sec)	Notes/Observations

**Data Table 2:**

Distance (unit)	Time (sec)	Notes/Observations
0	0	

Show calculations below for:

- Average speed:

